

(12) UK Patent Application (19) GB (11) 2 340 878 (13) A

(43) Date of A Publication 01.03.2000

(21) Application No 9919560.4

(22) Date of Filing 19.08.1999

(30) Priority Data

(31) 9818384

(32) 25.08.1998

(33) GB

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(51) INT CL⁷

E05C 17/04 17/24 // E05C 17/28

(52) UK CL (Edition R)

E2F FSB FSF F502 F503

E2M M11F1 M12A M12BX M15 M16 M25

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(58) Field of Search

UK CL (Edition Q) E2F FSB FSF

INT CL⁶ E05C 17/00 17/04 17/18 17/20 17/22 17/24
17/28 17/30

Online: WPI EPODOC JAPIO

(54) Abstract Title

Motor vehicle door assembly

(57) A motor vehicle door assembly (1) comprising a door (10) pivotally mounted about a generally horizontal axis (11) to a vehicle body (3), comprising retaining means (18) to maintain the door in an open position, said retaining means being fixedly connected at a first end (21) to one of the door or body and the second end (22) connected to the other of the door or body in one of a plurality of positions. The retaining means may be releasably/movably connected with connection provided by a rack and pinion, sprocket on a track or a spigot assembly. The retaining means may be a gas strut.

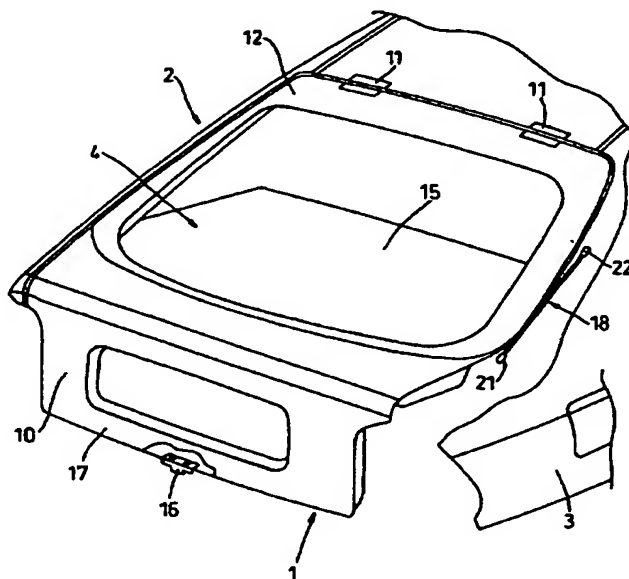


Fig. 1

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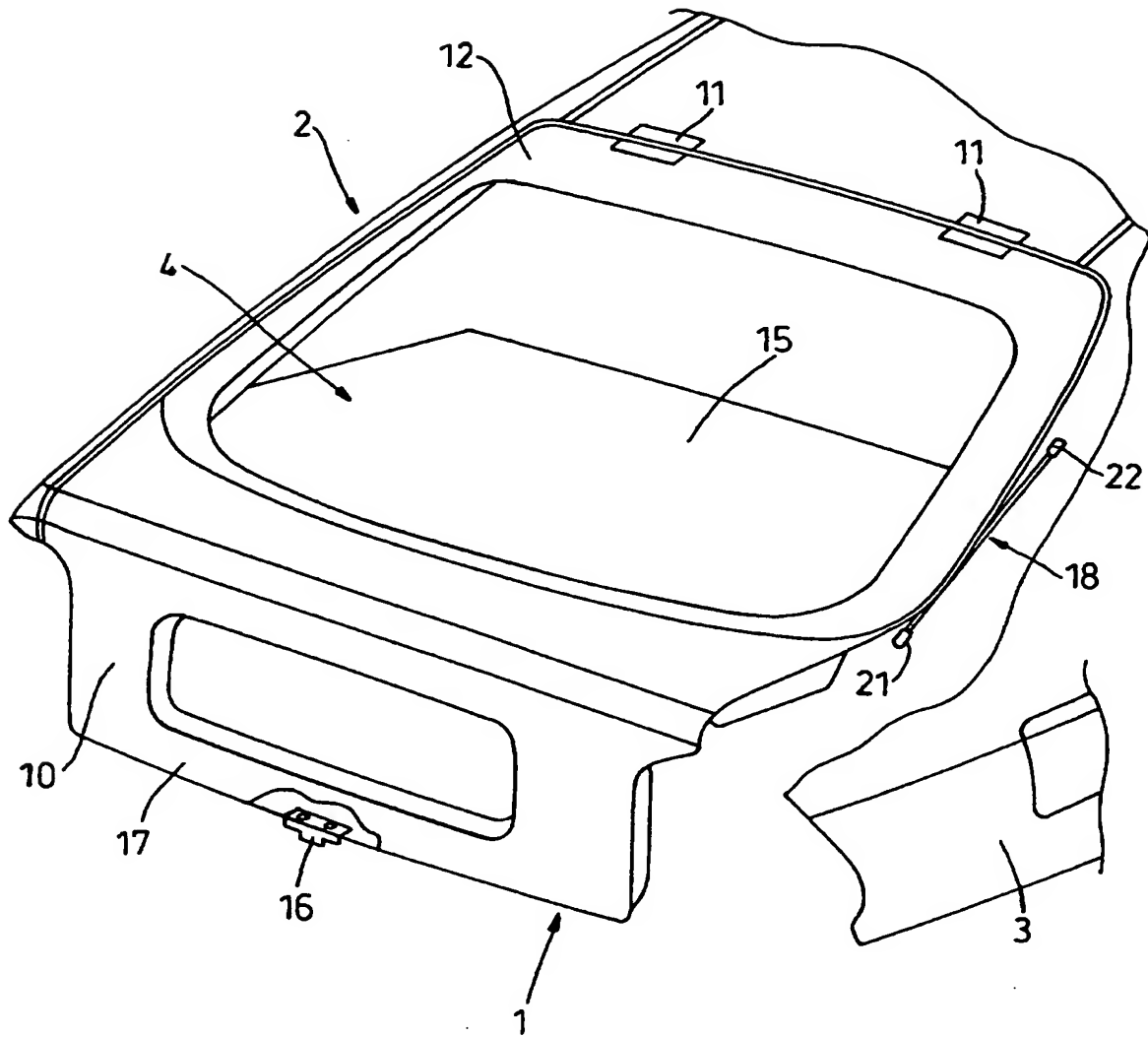


Fig. 1

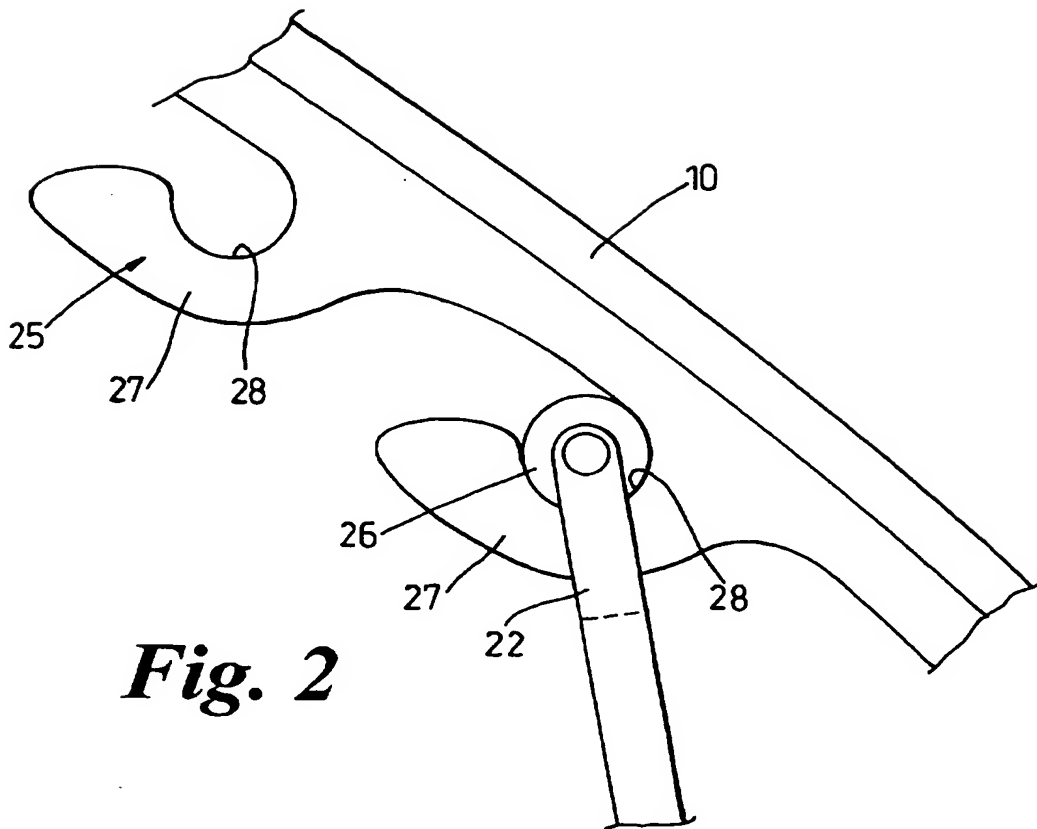


Fig. 2

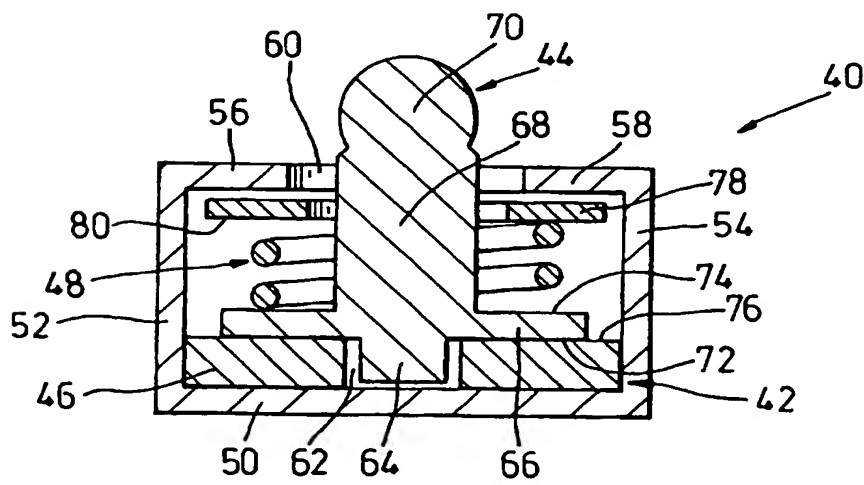


Fig. 4

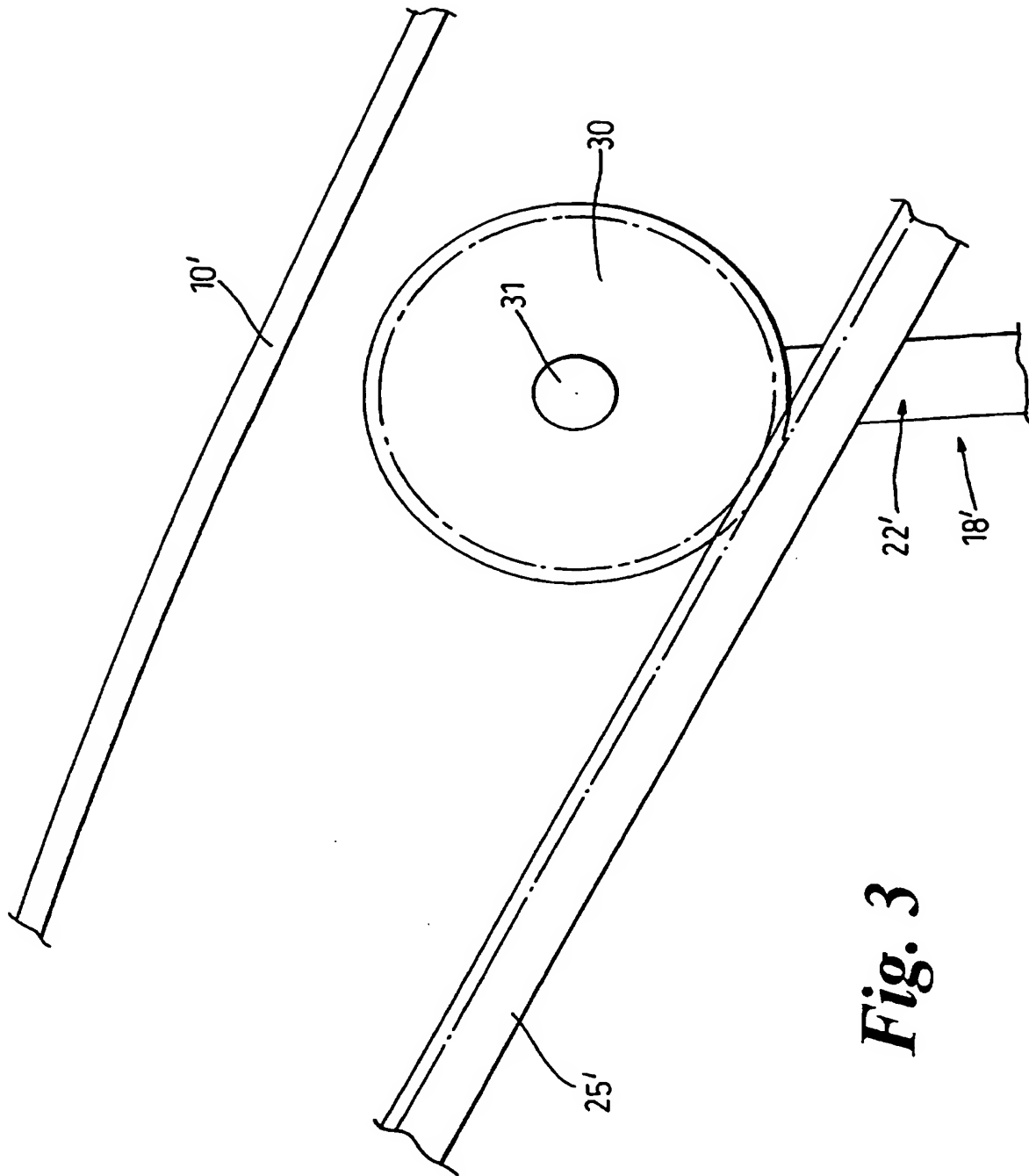


Fig. 3

Motor Vehicle Door Assembly

The present invention relates to an improved motor vehicle door assembly, and in particular to a motor vehicle door assembly hinged about a generally horizontal axis.

A motor vehicle door assembly hinged about a generally horizontal axis may be found at a front or rear of a motor vehicle. The door assembly is adapted to move between a lowered closed position to cover a body space of the vehicle and a raised open position to allow access to the body space. The open position is chosen so that a person of average height has convenient access to the space.

However, it will be understood that for individuals of smaller height than the average, the door assembly may be raised to a position higher than is comfortable or convenient to allow that person to return the door assembly to the closed position. Equally, for individuals of greater height than the average, the door assembly may not be raised to a position sufficiently high to allow that person comfortable or convenient access to the body space.

It is an advantage of the present invention that it eliminates, or substantially reduces these problems.

According to the present invention, a motor vehicle door assembly comprising a door pivotably mounted about a generally horizontal axis to a body of a vehicle between a closed position to cover a body space of the vehicle and an open position to allow access to the body space, retaining means to maintain the door in the open position, the retaining means being fixedly connected at a first end to one of the body and the door and connected at a second end to the other of the body and the door, characterised in that the retaining means is connected at the second end to one of a plurality of positions on the other of the body and the door.

Such an assembly has the advantage that the open position of the door can be adjusted to suit an individual.

Preferably the retaining means is releasably connected to the door.

Alternatively, the retaining means is movably connected to the door. Preferably, the retaining means is connected to the door by a rack and pinion. Alternatively, the retaining means is connected to the door by a sprocket on a track.

5 Conveniently the retaining means comprises at least one gas strut.

The invention will now be described, by way of a example only, with reference to the accompanying drawings, in which:

Figure 1 shows a perspective view of a vehicle including a door assembly according to the present invention;

10 Figure 2 shows a side view of a connecting means for use in the present invention;

Figure 3 shows a side view of a second connecting means according to the present invention; and

Figure 4 shows a sectional view or a further embodiment of a connecting means in accordance with the present invention.

15 Referring first to Figure 1, a vehicle 2 has a body 3 with an opening 4 at its rear end. A door assembly 1 including a door 10 is attached by hinges 11 to the vehicle body 3 at its upper edge 12. The door and the body define an interior body space. The body space is conveniently divided by a parcel shelf 15 extending from the door assembly to a rear seat bank (not shown). A latch mechanism 16 is provided on a lower edge 17 of the door to
20 releasably secure the door to the body in a closed position.

The door assembly also includes a retaining means 18 disposed on each side of the door. Each retaining means 18 is connected at a first end 21 to one of the body and the door and connected at a second end 22 to the other of the body and the door. In the embodiment of Figure 1, the retaining means comprise gas struts, in which the first end 21 of each gas strut

is fixedly pivotally connected to the body by any convenient means and the second end 22 of each gas strut is connected to one of a plurality of positions on the door. The manner in which the second end 22 of each gas strut is connected to one of a plurality of positions on the door is explained below.

5 In Figure 2, the second end 22 of a retaining means 18 is shown. The second end of the retaining means is adapted to engage a track 25 mounted on the door 10. The second end of the retaining means is forked. A pin 26 is rotatably mounted across the forked second end of the retaining means. The track 25 is provided with a number of hook-shaped protrusions 27 to define a plurality of positions at which the second end 22 of the retaining means may be
10 located. The pin 26 is adapted to releasably engage a recess 28 in a hook-shaped protrusion 27. If the user of the vehicle requires the open position of the door to be different, the pin can be removed from the recess 28 shown and moved to another thereby to vary the open position of the door.

In Figure 3, the second end 22' of a retaining means 18' is shown. The second end of
15 the retaining means is adapted to co-operate with a track 25' mounted from the door 10' by way of brackets (not shown). The second end of the retaining means is connected to a gear wheel 30 by way of a pin 31 rotatably mounted at the second end of the retaining means. The track 25 is provided with means to engage the gear wheel 30. For example, the track may take the form of a rack and the gear wheel a pinion wheel. Alternatively, the track may take
20 the form of a slotted path for co-operation with a gear wheel 30 in the form of a sprocket.

The position of the gear wheel on the track defines the open position of the door. If the user of the vehicle requires the open position of the door to be different, the gear wheel can be moved along the track from the position shown and moved to another position thereby to vary the open position of the door.

The gear wheel may be connected to a handle for ease of operation. Alternatively, the gear wheel may be driven by a motor for further ease of operation.

Turning to Figure 4, there is shown a sectional view of a further connecting means 40 in accordance with the present invention. The retaining means (not shown) is connected to the connecting means 40 in the form of a spigot assembly movable between a plurality of discrete positions. The connecting means 40 comprises a generally "U" shaped channel member 42 within which are located a spigot 44, a load retaining plate 46 with means to locate the spigot 44 in each of the plurality of discrete positions, and spring means 48 to bias the spigot into position on the load retaining plate 46.

10 The channel member 42 comprises a base 50 along which run a pair of upstanding walls 52,54. Each of the walls is provided with an inwardly directed flange 56,58 such that an opening 60 is defined between the inwardly directed flanges. Each end of the channel member 42 may be closed.

The load retaining plate 46 is located within the channel member 42 on the base 50.
15 The load retaining plate 46 is preferably connected to the base by welding, by adhesive or by any other suitable means. The load retaining plate 46 is provided with a plurality of openings 62. In the illustrated embodiment, the openings 62 are in the form of holes extending through the plate to serve as means to locate the spigot 44.

The spigot 44 comprises a locating portion 64, a radially outwardly directed flange 66, a shank 68 and a connecting portion 70. The locating portion 64 is adapted to be inserted within each of the plurality of openings 60. The flange 66 is arranged such that when the locating portion 64 is inserted in one of the openings 60, a lower surface 72 of the flange 66 abuts an upper surface 76 of the load retaining plate 46. In this position, the shank 68 of the spigot extends to or through the opening 60 in the channel member 42. The connecting

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portion 70 is located outside of the channel member 42 and is connected to a gas strut or similar retaining means (not shown).

The spring means 48 are provided to bias the spigot 44 into this position on the load retaining plate 46. In the illustrated embodiment, the spring means 48 takes the form of a
5 helical spring disposed about the shank 68 of the spigot 44 and acts between an upper surface 74 of the flange 66 and a lower surface 80 of a washer 78 disposed between the spring means 48 and the inwardly directed flanges 56,58 of the channel member 42.

In use, the gas strut or similar retaining means does not normally exert sufficient force in the direction of the spigot shank to cause the spigot 44 to move. However, the spigot 44
10 may be moved by pulling on the connecting portion 64 along the direction of the shank of the spigot against the force of the spring means to remove the locating portion 64 from the opening 62 in the load retaining plate 46. There is sufficient clearance allowed between the inwardly directed flanges of the channel member 42 and the flange 66 on the spigot 44 to allow this to occur. The spigot 44 may now be moved along the channel member 42 to
15 another position defined by another positioning opening 62 in the load retaining plate 46. The compressed spring means 48 urges the spigot 44 into this position when the spigot 44 is released.

CLAIMS

1. A motor vehicle door assembly comprising a door pivotably mounted about a generally horizontal axis to a body of a vehicle between a closed position to cover a body space of the vehicle and an open position to allow access to the body space, retaining means to maintain the door in the open position, the retaining means being fixedly connected at a first end to one of the body and the door and connected at a second end to the other of the body and the door, characterised in that the retaining means is connected at the second end to one of a plurality of positions on the other of the body and the door.
2. A door assembly according to claim 1, characterised in that the retaining means is releasably connected to the other of the body and the door.
3. A door assembly according to claim 1, characterised in that the retaining means is movably connected to the other of the body and the door.
4. A door assembly according to claim 3, characterised in that the retaining means is connected to the other of the body and the door by a rack and pinion.
5. A door assembly according to claim 3, characterised in that the retaining means is connected to the other of the body and the door by a sprocket on a track.
6. A door assembly according to claim 3, characterised in that the retaining means is connected to the other of the body and the door by a spigot assembly movable between a plurality of discrete positions.
7. A door assembly according to claim 6, characterised in that the spigot assembly comprises a generally "U" shaped channel member within which are located a spigot, a load retaining plate with means to locate the spigot in each of the plurality of discrete positions, and spring means to bias the spigot into position on the load retaining plate.

8. A door assembly according to claim 7, characterised in that the spring means is disposed between an outwardly directed flange of the spigot and a washer retained by the channel member.
9. A door assembly according to claim 7 or claim 8, characterised in that the spring means comprises a helical spring.
10. A door assembly according to any of claims 7 to 9, characterised in that means to locate the spigot in each of the plurality of discrete positions comprises openings in the load retaining plate into which a locating portion of the spigot may be inserted.
11. A door assembly according to any previous claim, characterised in that the retaining means comprises at least one gas strut.
12. A motor vehicle door assembly substantially as described herein with reference to and as illustrated herein with reference to any of the accompanying Figures.



Application No: GB 9919560.4
Claims searched: 1-12

Examiner: Barnaby Wright
Date of search: 16 December 1999

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
UK Cl (Ed.Q): E2F (FSB, FSF)
Int Cl (Ed.6): E05C (17/00, 17/04, 17/18, 17/20, 17/22, 17/24, 17/28, 17/30)
Other: Online: EPODOC WPI JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 1563538 SCHARWACHTER See especially all figs, and page 2, ln 72-15.	1-3,11
X	GB 1542535 FINGSCHEIDT GMBH See whole document, especially all figs and page 1, ln 12-28.	1-3,11
X	WO 80/00987 CAMPER & NICHOLSONS See especially figs 3-5 & 10-14, and page 2, line 33 to page 3, ln 20, and page 6, ln 2-15, and page 18, ln 17-20.	1-5,11
X	DE 19517780 A1 MERCEDES-BENZ See especially figs and WPI & EPODOC abstracts.	1-3,6,7,11
X	US 5639002 MERCEDES BENZ See especially all figs, and col 4, ln 10-34.	1-5
X	US 4772054 DAIMLER-BENZ See especially fig 1 and abstract.	1-3,5,11
X	US 4565407 DEERE & CO See whole document.	1-3,5,11

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.



Application No: GB 9919560.4
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Category	Identity of document and relevant passage	Relevant to claims
X	US 4194264 STROFFREGEN See especially fig 1.	1-3,5,11

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
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